

PATENT COOPERATION TREATY

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

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PCT
WRITTEN OPINION
(PCT Rule 66)

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Date of mailing (day/month/year) **25 AUG 2005**

Applicant's or agent's file reference
TING/20302314/KC/EK/kt

REPLY DUE within **ONE MONTH**
from the above date of mailing

International Application No.
PCT/SG2003/000223

International Filing Date (day/month/year)
19 September 2003

Priority Date (day/month/year)
19 September 2003

International Patent Classification (IPC) or both national classification and IPC
Int. Cl. ⁷ **H01L 21/4763, 21/285, 23/36, 23/367, 23/373, 31/024, 31/052, 31/18, H01S 5/024**

Applicant
TINGGI TECHNOLOGIES PRIVATE LIMITED et al

This written opinion is the **third** drawn by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

3. The **FINAL DATE** by which the international preliminary examination report must be established according to Rule 69.2 is:
19 January 2006

4. The applicant is hereby invited to reply to this opinion.

When? See the Reply Due date indicated above. However, the Australian Patent Office will not establish the Report before the earlier of (i) a response being filed, or (ii) one month before the Final Date by which the international preliminary examination report must be established. The Report will take into account any response (including amendments) filed before the Report is established. If no response is filed by 1 month before the Final Date, the international preliminary examination report will be established on the basis of this opinion.

Applicants wishing to have the benefit of a further opinion (if needed) before the report is established should ensure that a response is filed at least 3 months before the Final Date by which the international preliminary examination report must be established.

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also For an additional opportunity to submit amendments, see Rule 66.4. For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4bis. For an informal communication with the examiner, see Rule 66.6.

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INDEX	/	/
DUE DATE	/	/
25-9-05	/	/
REMINDER	/	/
16-9-05	/	/

AVAILABLE COPY

I. Basis of the opinion**1. With regard to the elements of the international application:***

- ☐ the international application as originally filed.
- ☒ the description, pages **1-11**, as originally filed,
pages , filed with the demand,
pages , received on with the letter of
- ☒ the claims, pages **12-13**, as originally filed,
pages , as amended under Article 19,
pages , filed with the demand,
pages **14-17**, received on **25 July 2005** with the letter of **25 July 2005**
- ☒ the drawings, pages **1-5**, as originally filed,
pages , filed with the demand,
pages , received on with the letter of
- ☐ the sequence listing part of the description:
pages , as originally filed
pages , filed with the demand
pages , received on with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the written opinion was drawn on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.

5. ☐ This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. The claims are unclear with respect to the use of the term "wafer" (eg, independent claims 1, 43, 48 and 50), and the distinction between this term and "substrate". In common usage, a "wafer" typically refers to the common substrate on which a plurality of devices are formed. However, in Figure 1 the wafer 10 appears to refer to all elements of the devices, including the "substrate"; while in independent claims 1, 48 and 50 it appears that the wafer refers only to the device layers. For the purposes of this report I have interpreted "wafer" and "substrate" to be the same, and to refer to the layer on which the semiconductor devices of the claims are formed.

While the applicant has agreed with this interpretation, the claims remain *prima facie* unclear for the above reasons (in more detail, for example, claim 1 refers to a "substrate" on lines 1 and 7 but to a "wafer" on lines 2 and 4, *prima facie* suggesting these terms must refer to *different* features – this is further suggested by claim 15, which implies that the "wafer" remains after the removal of the "substrate" in step (c)).

As noted in the previous Opinion, this clarity issue is significant, as a different interpretation may lead to novelty and inventive step objections being raised (eg, Figures 2a and 2b of D1 in Box V show a copper layer electroplated on a 'wafer' device 1110, 1106, on the side remote from a 'substrate' 1105, with ohmic contacts 1020 and 1118, and with subsequent removal of the 'substrate' 1105).

2. Independent claim 1 is not clear with respect to "a relatively thick layer" (eg, line 5 of claim 1), and in particular whether 'relative' is in respect of the seed layer, the device layers, or the substrate. Perhaps it would be clearer if a functional criterion was given, such as sufficient thickness to provide a heat sink or mechanical support, or if a minimum thickness was given (eg, noting page 6 line 10, 50 microns).

The applicant has argued that *the term "relatively" refers to the layer being relatively thick as opposed to relative to a particular feature*. However, it is a matter of plain English that "relatively thick" has no absolute meaning; it *intrinsically* means thick in comparison to something else. Hence this argument must be rejected.